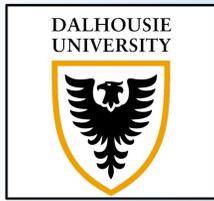


Thermal Drivers of Overwintering Behaviour in Eastern Ribbonsnakes (*Thamnophis sauritus*) in Nova Scotia

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INTRODUCTION



Eastern Ribbonsnake, Steve Bower

- ❖ Eastern Ribbonsnakes (*Thamnophis sauritus*) are a **Threatened species** in Nova Scotia [1].
- ❖ **Overwintering behaviour is poorly understood** due to cryptic underground hibernacula [2].
- ❖ Identifying **active hibernacula** and the **temperature cues** driving autumn ingress is essential in population recovery [3].

METHODS

- ❖ **65 snakes PIT-tagged** with 8 mm tags
- ❖ Four suspected hibernacula monitored from late September–November 2025.



PIT Tag Insertion, Brendan Ward

- ❖ **Continuous PIT antenna arrays** (single- and multi-cord) recorded **above-ground detections**.
- ❖ **Air, surface, and ground temperatures** logged every 30 minutes to characterize microclimates during ingress.



Pit Tag Antenna Arrays in Southwestern Nova Scotia

RESULTS

PTA 1

- ❖ Detections: Sept 26–Oct 8 (**earlier, warmer conditions**).
- ❖ Air Temps: 19.9–24.3 °C; Ground Temps: 15.2–18.4 °C.

PTA 3

- ❖ Detections: Oct 15–27 (**later, cooler conditions**).
- ❖ Air Temps: 10.3–21.2 °C; Ground Temps: 11.4–15.2 °C.

Ground vs Air Temp during Detections

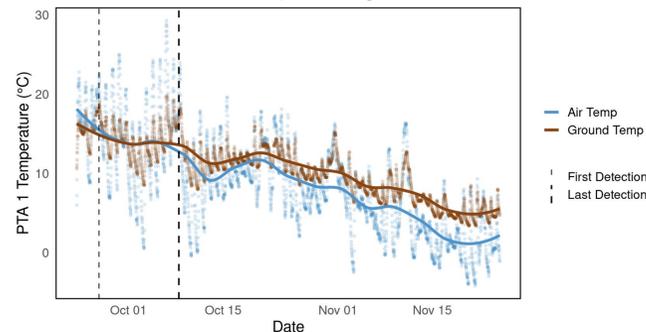


Figure 3. Temperature trends and PIT tag detections at PTA 1 during the 2025 ingress period. Air (blue; 1 m above ground) and ground (brown; ~1 m below surface) temperatures recorded from late September through mid-November 2025.

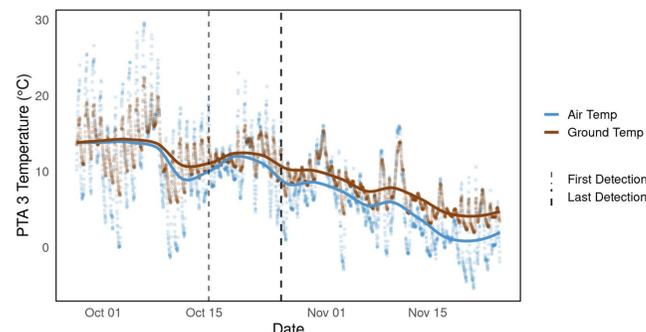


Figure 4. Temperature trends and PIT tag detections at PTA 3 during the 2025 ingress period. Air (blue; 1 m above ground) and ground (brown; ~1 m below surface) temperatures from late September through mid-November 2025.

Detections over Mean Daily Air Temp

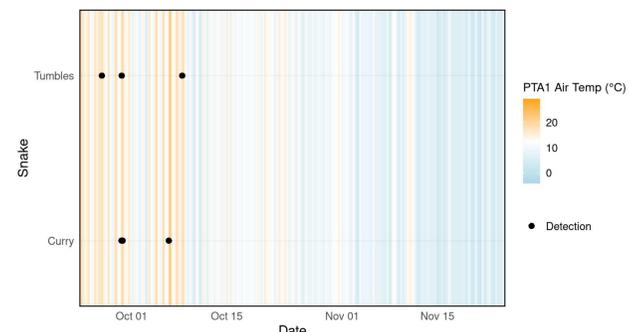


Figure 1. PTA 1 air temperature and snake detections during the 2025 ingress period. Mean daily air temperatures shown as a background gradient. Black points represent PIT tag detections of individual Eastern Ribbonsnakes over time.

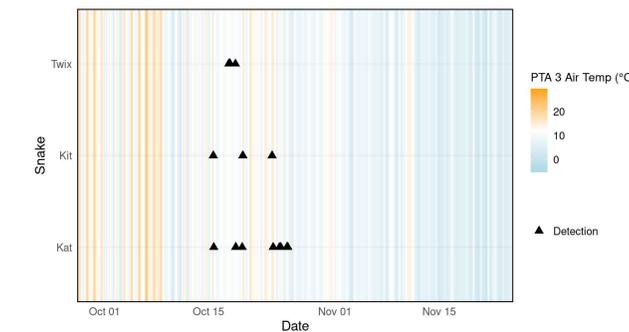


Figure 2. PTA 3 air temperature and snake detections during the 2025 ingress period. Mean daily air temperatures shown as a background gradient. Black triangles represent PIT tag detections of individual Eastern Ribbonsnakes over time.

DISCUSSION

- ❖ Across both sites, same pattern, ingress aligned with the point when **air temperature fell below ground temperature**, suggesting snakes respond to **relative thermal gradients**, not fixed thresholds.
- ❖ Snakes may use surface-level cues to anticipate when underground conditions become more favourable.
- ❖ Ground temp displays hibernacula **stable microclimates**.
- ❖ Lack of detections at PTA 2 & 4 may indicate **lack of site fidelity**.

CONCLUSION

- ❖ Two **active hibernacula were confirmed**, ingress occurred once air temp was lower than ground, indicating reliance on **relative thermal dynamics**.
- ❖ Behaviour suggests snakes use **surface cues** (cooling rates, reduced heat retention) to time ingress, raising questions about how they assess changing thermal environments.
- ❖ Maintaining diverse, thermally stable hibernacula will support this at-risk population. Continued monitoring will improve understanding of **site fidelity and habitat suitability**.



PIT Tag Array System at Hibernaculum

REFERENCES



CONTACT

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